

Water Detectives Unsolved Case

Teacher Instructions

You will need:

Activity packet for each student.

Experiment Materials Required:

- Measuring Cups
- Water

Getting Started

1. The students are going to become detectives who need to solve Case #1426.
2. Have the students read their activity packet individually.

Before the Experiment

1. Have the students create a hypothesis (educated guess) before beginning the experiment.
2. Group the students
3. Distribute a clear measuring cup to each group. Instruct them to fill the cup with water up to the one cup line, then place it near a window.
4. Each group is responsible for measuring their cup each day and recording the measurements.
5. Once the class has completed the experiment, check and make sure the students have recorded their results and conclusions.
6. Have the students work in groups to discuss what their hypothesis was and the conclusion.

Think about it!

Group discussion questions

1. Did each group have the same results? Look at where the cups were located. Environmental variable; was one group's cup exposed to more sun than another group's?
2. What about the weather? Was it sunny every day of the experiment or was it raining, cloudy, or foggy, for example? How could this variable affect the conclusion of the experiment?
3. Explain what the variables are in this case which will help you figure out what happened to Joe. A variable can be defined as something that is subject to change or variation; Known to be inconsistent.

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It was about half past seven in the morning when we got the call. Johnny Bash called us out to his brother's home in Miami. Once we arrived at the home, Johnny was a mess. He had discovered his brother was missing when he came by for a surprise visit. "Where could he be?" he kept asking. You see, Johnny and his brother Joe are pretty close. Johnny, who has a family in New York, tries to visit Joe once a month.

We asked Johnny how long it had been since he had seen or spoken to Joe. He explained that last month he got caught up into some trouble and wasn't able to call or visit Joe.

"Do you know some of the places he may have gone?" I asked. Johnny sighed and started to wander around the home of his brother.

"I know he wouldn't do anything out of the ordinary. He is very predictable," Johnny said.

"If he has been gone for less than a day, he is probably at the local motorcycle shop. If he's been gone for fewer than 4 days, then he might be visiting one of his best friends up North. He wouldn't stay there longer than 4 days because his friend doesn't have an extra bed and Johnny gets tired of sleeping on the floor."

"This is great! Can you think of any other places he might go?" asked another detective.

"Yes, of course. I know my brother very well," said Johnny.

"If he's been gone for more than 4 days, but fewer than 8, then he probably went on a cruise. He couldn't afford a cruise for more than 8 days. If he's been gone for more than 8 days, but fewer than 4 weeks, then he probably went to Italy with a student exchange program through the university. He applied months ago. If he's been gone for more than 4 weeks, then he probably went to his condo in California. I know that he doesn't stay there longer than 2 months."

I could sense the fear in Johnny's voice just before he shouted, "If he has not returned by then, aliens must have captured him and taken him to space!"

"Have no worries, Johnny. We will help you find your brother," said another detective as he finished searching the house.

"Find anything?" Johnny asked.

"Not yet," said the detective, "but I did notice this measuring cup on the window sill."



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“Oh yeah, he always fills the measuring cup with a cup of water and places it on the window sill. He has to measure the amount of water he uses for his delicate azalea plant. It’s the only plant he has left!”

“I’ve got it!” I said. “We can begin by researching the cup of water. The measuring cup only has $\frac{3}{4}$ of a cup of water. I think we might be on to something here.”

Johnny looked confused. “How? Who? What?” he asked.

“It’s a matter of evaporation. The warmth of the sun changes the liquid into water vapor that we can’t see. Soon after, the water vapor condenses and forms a cloud. Eventually, the water comes back to the ground as rain, snow, or hail. Over time, it evaporates again. You see, it’s part of the water cycle.”



“I see,” said Johnny. “So, what can we do now?”

“We are going to doing an experiment. We will put a cup of water in a sunny place and keep track of how long it takes to evaporate. Based on the results we get, we will be able to estimate how long ago your brother Joe left the measuring cup on the window sill.”

“Let’s get started!” Johnny said with enthusiasm. “What can I do?”

“You should water the plant,” I said.